ETUDE DE LA FONCTION PARABOLE : version Yasmina cf p 17&18

Parabole $\equiv y^2 = 2px$

$y^2 = 2px \Rightarrow y = \pm\sqrt{2px}$

$D: \mathbb{R}^+$

Parité : $\not\exists$ (c'est une racine $\Rightarrow$ juste valeurs positives)

$y = \sqrt{2px}$

x	0	
y	0	$+$

Racines : $x = 0$

$y' = (\sqrt{2px})' = (\sqrt{2p}\cdot\sqrt{x})'$

$= (\sqrt{2p}\cdot(x)^{1/2})'$ $\qquad (f\cdot g)' = f'g + fg'$

$= 0 + \sqrt{2p}\cdot\frac{1}{2}(x)^{-1/2}\cdot 1$

$= \frac{\sqrt{2p}}{2\sqrt{x}}$

x	0	
y'	/	$+$

$y'' = \left(\frac{\sqrt{2p}}{2\sqrt{x}}\right)'$ $\qquad \left(\frac{f}{g}\right)' = \frac{f'g - fg'}{g^2}$

$= \frac{0 - \sqrt{2p}\cdot(2\sqrt{x})'}{(2\sqrt{x})^2}$

$= \frac{-\sqrt{2p}\cdot(2(x)^{1/2})'}{(2\sqrt{x})^2}$

$= \frac{-\sqrt{2p}\cdot\cancel{2}\cdot\frac{1}{\cancel{2}}\cdot(x)^{-1/2}\cdot 1}{(2\sqrt{x})^2}$

$= \frac{-\sqrt{2p}\cdot(x)^{-1/2}}{4x} = \frac{-\sqrt{2p}}{4x\sqrt{x}} = \frac{-\sqrt{2p}}{4\sqrt{x^3}}$

x	0	
y''	/	$-$

AV : $\not\exists$ $(\Rightarrow D: \mathbb{R}^+)$

AH : $\lim_{x\to+\infty} \sqrt{2px} = +\infty \Rightarrow$ AH : $\not\exists$

AO : $\not\exists$ $\left(m = \lim_{x\to+\infty} \frac{f(x)}{x} = \lim_{x\to+\infty} \frac{\sqrt{2px}}{x} = 0\right)$